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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

AM-8304

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on September 13, 2007Signature Midori Greenwood-GoodwinTyped or printed name Midori Greenwood-Goodwin

Application Number

10/788,979

Filed

February 27, 2004

First Named Inventor

Wolfgang ADERHOLD

Art Unit

3742

Examiner

S.Y. Paik

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

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Registration number if acting under 37 CFR 1.34 _____

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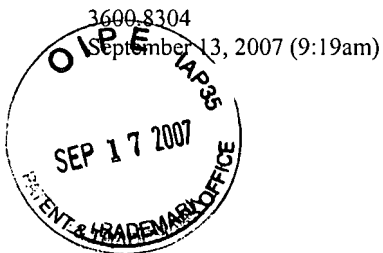
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.

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Introductory Comments

CERTIFICATE OF MAILING

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Date: September 13, 2007 Midori Greenwood-Goodwin
Midori Greenwood-Goodwin

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Wolfgang ADERHOLD

Attorneys Docket: AM-8304

Serial No.: 10/788,979

Confirmation No.: 6862

Filed: February 27, 2004

Art Unit No.: 3742

Examiner: S. Y. Paik

For: "BACKSIDE RAPID THERMAL PROCESSING OF PATTERNED WAFERS"

Commissioner for Patents
Alexandria, VA 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

Accompanying a Notice of Appeal, Applicants request a review of the rejection prior to filing of the Appeal Brief.

The claims on appeal are claims 1-9, 12-15, 19, and 30-32. Contrary to the Advisory Action dated August 3, 2007, claim 16 was been canceled in the after-final amendment of July 16,

2007, which the examiner entered for purposes of appeal.

The invention concerns upside-down thermal processing, especially from a bank of overhead incandescent lamps, of a wafer or other substrate. Most conventionally, the back side of a wafer is supported from below and its front side containing the structure of the developing integrated circuit is irradiated or otherwise heated from above. In the claimed embodiments of the invention, the structured front side of the wafer is supported from below and the structureless back side is irradiated from above. The independent claims recite further features of this arrangement.

All pending claims stand rejected over Ballance or Anderson in view of Moslehi '499 or Moslehi '538.

The rejection requires combining features of the conventional back side support and upwardly oriented wafer front side of the first two references with the less conventional downwardly oriented wafer front side of the latter two references without regard to the function of the described features with respect to the orientation of the wafer. A combination rejection requires more than finding the various parts in various references. It requires some reason to make the combination.

Base claim 1 requires that the front side of the wafer be pyrometrically monitored. Ballance shows the conventional rapid thermal processing (RTP) configuration of a wafer supported on its backside and irradiated from above on its front side, and a pyrometer monitoring the back side from below. Anderson shows a different configuration in which the wafer is enclosed in a black body cavity formed by two heat plates which are irradiated from above below and a pyrometer monitors the temperature of the lower heat plate partially forming the black body cavity around the wafer. The heat plates are opaque to infrared radiation so the pyrometer does not monitor the bottom side of the wafer but instead monitors the lower heat plate. Anderson fails to specify that the wafer front side is facing upwards, but since the wafer is supported at different times on its bottom, it must be assumed that Anderson uses the conventional upwardly facing wafer front side. Moslehi '538 thermally processes a wafer having its front side facing down with heating from above. However, Moslehi '538 pyrometrically monitors the wafer back

side from above. Moslehi '499 discloses a similar wafer and lamp arrangement but uses a light reflection technique to thermally monitor the upwardly facing back side of the inverted wafer. Thus, none of the applied art discloses pyrometric monitoring of the structured front side of the wafer as required by claim 1. While Moslehi '499 and '538 show upside-down thermal processing, they also teach thermal monitoring of the wafer back side not the downwardly facing structured back side required by claim 1.

Base claim 3 also requires thermal monitoring of the downwardly facing front side of the wafer, which has been distinguished above. Further, claim 3 requires supporting the inverted wafer on an annular shelf extending no further inwardly than an edge exclusion zone of the front face of the wafer. Ballance and Anderson support the wafer back side. Moslehi '538 apparently supports the wafer front side but is silent on the details of the support. Moslehi '499 discloses a front side support of three pins, not an annular shelf. Thus, none of the applied art discloses supporting the front side of a wafer by an annular shelf. Further, none of the art even mentions an edge exclusion zone or a positioning of Moslehi's support pins within this zone.

Dependent claim 4 requires the edge exclusion zone and hence region above the support to be no more than 3mm, a distance not disclosed in any applied reference.

Dependent claim 3 requires the annular shelf for supporting the wafer to be sloping. The applied art fails to disclose a sloping annular support shelf. At best, Moslehi '499 discloses three-point support on three pins having sloping sides away from the respective support points.

Base claim 8 requires that the thermally processed wafer be positioned with its back side facing a heat source from above and a front side facing a reflector. Ballance positions his wafer oppositely from the claimed orientation. Anderson does not have a reflector on either side but relies on two heating plates forming a back body cavity having side, which heating plates are irradiated from above and below, a configuration not benefitting from a reflector. Neither Moslehi '499 nor Moslehi '538 show a reflector on the bottom side of the RTP chamber. Also, some of their thermal monitoring schemes rely upon light transmitted through the bottom of the RTP chamber, which argues against that bottom surface being reflective. Thus, none of the art shows an radiant thermal processing chamber having a reflector facing the wafer front side, more

or less a downwardly facing wafer front side.

Base claim 12 similarly requires the reflector be positioned on a side of a wafer having its front side facing downwardly and a radiant heat source irradiating downwardly to the wafer back side. This combination has been distinguished above for claim 8 over the applied art.

Dependent claim 13 requires the annular ring in the holding means to overlap the front side only within the edge exclusion zone. This feature has been distinguished above for claim 3.

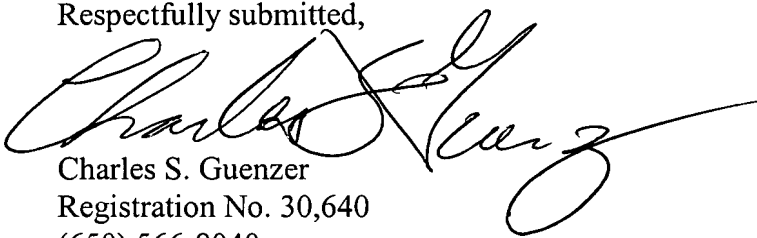
Dependent claim 32 requires the annular ring to include a sloping annular shelf. The applied art fails to disclose a sloping annular support shelf, more or less one supporting the wafer front side.

The ordinary mechanic in reviewing the inverted orientation of the Moslehi references would not find it obvious to simply transfer that inverted orientation but not the associated apparatus features to the apparatus of Ballance and Anderson, which were designed for the conventional upward orientation of the wafer front side. Accordingly, the obviousness rejection should be removed.

In view of the above amendments and remarks, reconsideration and allowance of all claims are respectfully requested. If the Examiner believes that a telephone interview would be helpful, he is invited to contact the undersigned attorney at the listed telephone number, which is on California time.

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Respectfully submitted,


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